



Health Technology Education Program Annual Report 2018

I ILLINOIS
College of Applied Health Sciences

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College of Engineering

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Health Technology

is a broad term for all consumer-facing technologies intended to support individuals in maintaining or improving their health and independence.



Health Technology

The College of Applied Health Sciences, in collaboration with the College of Engineering at the University of Illinois at Urbana-Champaign, is establishing a cutting-edge interdisciplinary **Health Technology Education Program** which will be housed in the Department of Kinesiology and Community Health. Many societal factors have converged to create a vital need for an academic response to support design and dissemination of technologies for health and wellness.

The **Health Technology Education Program** will include:

- Master of Science in Health Technology
- Graduate Certificates in Health Technology
- Undergraduate Certificates in Health Technology
- Undergraduate Digital Badges (e.g., LinkedIn)
- Professional Continuing Education



Education Program Overview

MS in Health Technology

The timing is right to develop a new Master of Science in Health Technology. Campus developments (e.g., the Carle-Illinois College of Medicine, Siebel Center for Design) combined with increased demand for professionals within the health field converge to support the development of this degree program. The proposed MS in Health Technology will educate the next generation of applied health care and engineering professionals in the development, testing, and use of new technologies that promote health, rehabilitation, mitigate disability, and improve independence and quality of life. Graduates will find career opportunities in industry, community organizations, and government. This program will provide individuals with the skills and expertise that are highly sought by consumer health care product industries, regulatory agencies, and government organizations.

Graduate Certificates in Health Technology

Certificates for graduate students will be developed in topics related to Health Technology.

Undergraduate Certificates & Digital Badges in Health Technology

Undergraduates will be able to demonstrate specializations in Health Technology topics through Certificates and Digital Badges.

Professional Continuing Education

Working professionals in fields such as physical therapy, occupational therapy, nursing, and engineering will be among those offered Continuing Education Units in Health Technology.

Meet the Health Technology



Wendy A. Rogers, Ph.D. is the Director of the Health Technology Education Program housed within the Department of Kinesiology and Community Health in the College of Applied Health Sciences. Professor Rogers is the Shahid and Ann Carlson Khan Professor of Applied Health Sciences. She is also the Director of CHART (Collaborations in Health, Aging, Research, and Technology) and runs the HFA (Human Factors and Aging) Lab. Rogers holds a position of Professor in Kinesiology and Community Health, but also has appointments in the Educational Psychology Department and the

Beckman Institute. She is a certified Human Factors Professional (BCPE Certificate #1539). Rogers' research interests include design for aging; technology acceptance; human-automation interaction; aging-in-place; human-robot interaction; aging with disabilities; and cognitive aging.

Jeffrey A. Woods, Ph.D. is the Associate Dean for Research in the College of Applied Health Sciences, a Professor in Kinesiology and Community Health, and a member of the Health Technology program development team. He is also the Director of CHAD (Center on Health, Aging, and Disability). Housed within the College of Applied Health Sciences, CHAD provides support services for leadership in national and international interdisciplinary research, education, and outreach that promotes health and wellness across the lifespan; healthy aging; healthy communities; and optimal participation of individuals with disabilities. Dean Woods also leads the Exercise Immunology Research Lab in the Department of Kinesiology and Community Health. His research interests include exercise physiology; the role of exercise in the modulation of immune function in the young and old; neuroendocrine mechanisms underlying exercise and stress-induced immunomodulation.



Development Team



Nicole Holtzclaw-Stone, Ph.D. is Assistant Director for the Health Technology Education Program. Holtzclaw-Stone has been instrumental in the development of the MS in Health Technology program proposal. She will serve as the primary advisor for all MS in Health Technology graduate students once students start the program in Fall of 2020. She has 10 years of experience in academic advising and academic program management. She will also serve as the primary liaison to industry, community, and government partners who will provide possible capstone project experiences for MS in Health Technology graduate students.

Thenkurussi (Kesh) Kesavadas, Ph.D. is the Director of Health Care Engineering Systems Center at the University of Illinois at Urbana-Champaign and a member of the Health Technology program development team. Before coming to Illinois, Kesavadas was a professor in the Department of Mechanical and Aerospace Engineering at the University at Buffalo (NY), where he founded the University at Buffalo Virtual Reality Laboratory. Kesavadas has been in the forefront of Virtual Reality and its application to medicine



since 1993, when this field was still in its infancy. In 2004, Dr. Kesavadas was honored as the “Inventor of the Year” Western New York. He has also won numerous awards including SUNY Chancellor’s award for Innovation in 2004 and UB Visionary of the year award in 2010. He developed the world’s first stand-alone virtual reality Robotic Surgical Simulator RoSS and also co-founded two start-up companies. His own research interests are in the areas of medical robotics and simulation, virtual reality in design, haptics and human-computer interaction. Kesavadas is a Fellow of American Society of Mechanical Engineering and a member of IEEE. He also serves as “Engineer in Chief” of the Jump ARCHES collaborative partnership between the College of Engineering at Illinois and health care providers at OSF HealthCare and at the University of Illinois’ College of Medicine at Peoria.

Presentation to Chinese Delegation

In Spring of 2018, Assistant Director Holtzclaw-Stone presented on the status of the development of the MS in Health Technology to a delegation of Chinese administrators from Northeastern University at Qinhaungdao.

Presentation to Teaching Academy

In the Spring of 2018, the Health Technology team presented on the “Technology for Health and Independence” program. The presentation centered on sharing progress in development of the MS in Health Technology and seeking feedback from faculty and advisors in Applied Health Sciences.

Technology for Health and Independence (THI) rebranded

In the Summer of 2018, the Health Technology team reflected on the name “Technology for Health and Independence” and what meaning this conveyed to the MS in Health Technology program. The name “Technology for Health and Independence” was born out of the Investment for Growth Proposal (IFG). In the IFG proposal, “Technology for Health and Independence” was identified as a unifying theme for research, education, and outreach programs. The education aspect of the program was later rebranded as the **Health Technology Education Program** to reflect the educational mission and the goals of offering the MS in Health Technology, undergraduate and graduate level certificates, digital badges, and continuing education units.

Poster presentation at HCESC Symposium

In the Fall 2018, Assistant Director Holtzclaw-Stone presented a poster titled “Health Technology Graduate and Continuing Education Program” at the Health Care Engineering Systems Center Symposium at the I-Hotel which promoted the proposed master’s degree to faculty across the University.

Nine Courses in Health Technology Proposed

In the Fall of 2018, the Health Technology Development Team proposed nine new courses in Health Technology to the Department of Kinesiology and Community Health Educational Policy Committee. Courses will proceed from this committee to College of AHS and campus approval processes.

Educational Policy Committee Proposal

In the Fall of 2018, months of preparation culminated in the successful submission of the MS in Health Technology proposal to the Department of Kinesiology and Community Health Educational Policy Committee. This is the first of a multi-staged process towards getting the degree finalized and offered in 2020. The proposal must go through the College of Applied Health Sciences, the Graduate College, the Academic Senate Educational Policy Committee, the University Senates Committee, the Board of Trustees, and the Illinois Board of Higher Education before it is finalized and on offer to students.

“Tell me and I forget.

Teach me and I remember.

Involve me and I learn.”

— *Benjamin Franklin*

Master of Science in Health Technology

Vision:

Educating the next generation of applied health technology professionals.

The **MS in Health Technology** (not yet approved by Illinois Board of Higher Education) is an innovative master's program that will be a one-year intensive, 36 credit hour program that concludes with a **Capstone Project**. Students will enroll in 16 hours of required core courses, 8 hours of coursework related to their **Capstone Project**, and 12 hours of electives drawn from the Colleges of Applied Health Sciences and Engineering.

We will partner with industry, government, community-based organizations, and academia to provide a **Capstone Project** that is extended, intensive, targeted, practical, and problem-based. Students will work on problems provided by industry, government, community-based organizations, or academia. Companies and organizations can sponsor a student in their **Capstone Project** over the summer, following two semesters of coursework. After working on a specific problem for the company or organization, the student will submit a technical report and presentation to the MS program for evaluation.

Mission:

To develop interdisciplinary practitioners through classroom experience and experiential learning to have the knowledge, skills, and abilities to advance applied health technology design and implementation.

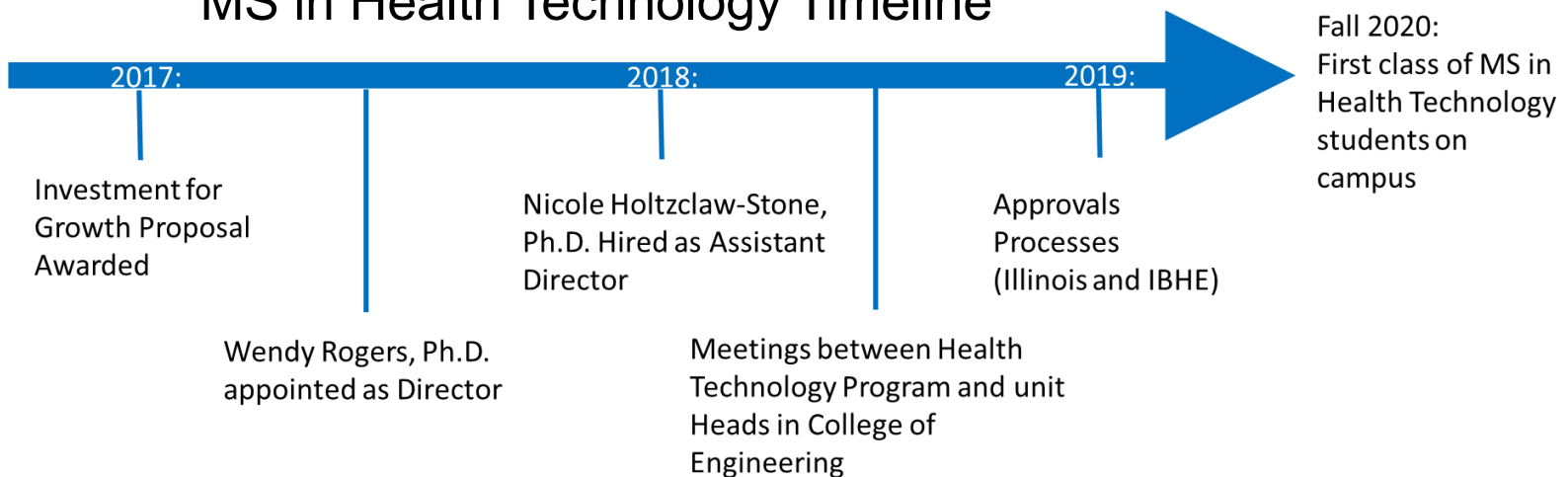
The **Master of Science in Health Technology** program brings together end-users (e.g., children, older adults, individuals with disabilities and chronic conditions), industry professionals, and allied health professionals together with Illinois students and faculty in a multi-disciplinary and inter-generational environment to identify existing problems and develop technologies to solve them. Students will have the opportunity to test technologies with end-users in the **Living in Interactive Future Environments (LIFE) Home**. The LIFE Home simulates existing home dwellings as well as provides space for development of smart home technologies.

Proposed Courses for MS in Health Technology

HT 501: Understanding Users of Health Technology (4 hours)
HT 502: Overview of Human Factors Methods for Health (4 hours)
HT 503: Hardware Engineering for Health Technology (4 hours)
HT 504: Software Engineering for Health Technology (4 hours)
HT 510: Capstone Project Orientation (1 hour)
HT 511: Capstone Project Development (3 hours)
HT 512: Capstone Project Implementation (4 hours)
Health Technology Electives (12 hours)
TOTAL HOURS: 36 credit hours

Health Technology electives will be selected from existing courses in the Colleges of Applied Health Sciences and Engineering. Health Technology graduate students will choose electives from an approved list with the assistance of Assistant

MS in Health Technology Timeline



Core Competencies

Comprehension of varying user needs (*age, culture, goals, experience, (dis)abilities*)

Knowledge of human factors tools and techniques

Familiarity with research methods, theory, and data analytics

Understanding of hardware components (*sensors, wearables, devices*)

Facility with software (*rapid prototyping, simulation tools*)

Awareness of regulations, policies, standards

Appreciation of ethical issues in design and implementation

Communication skills (*written and oral*)



Possible careers for MS in Health Technology graduates:

Applied Cognitive Scientist
Cognitive Systems Engineer
Data Decision Analyst
Human Factors Engineer
Human Factors Researcher
Junior/Senior Ergonomist
Usability Engineer
User Experience Lead
Visual Designer

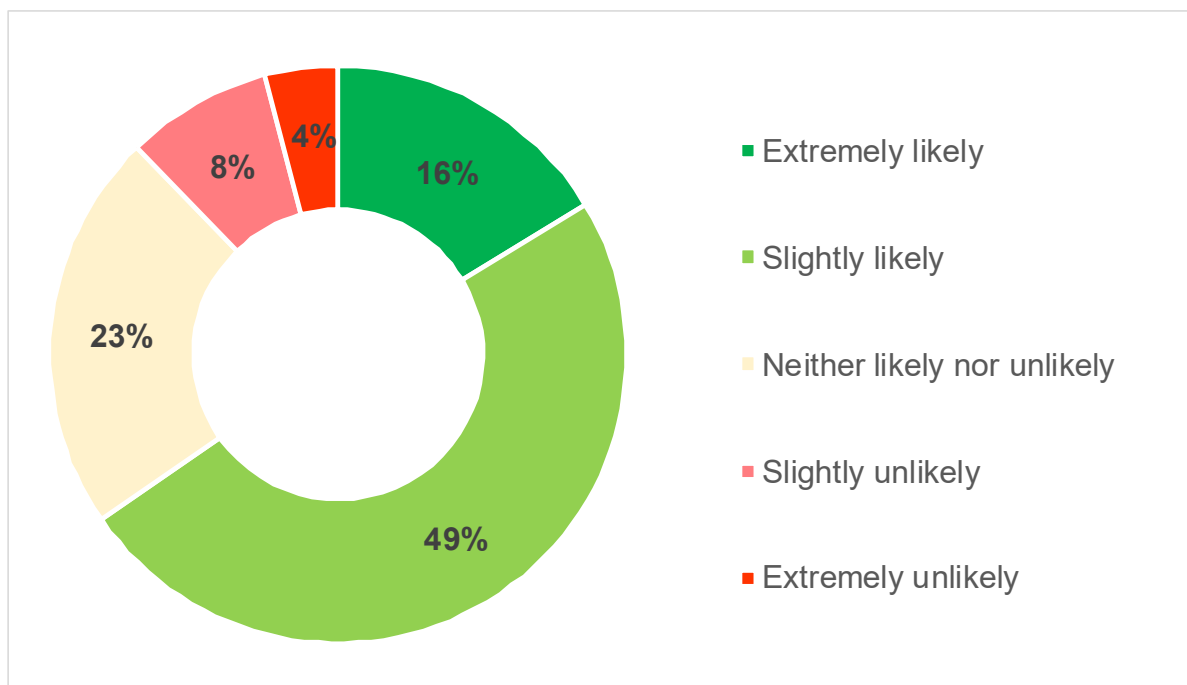
Employment Sectors for MS in Health Technology graduates:

Health Technology
Health Engineering
Regulatory Agencies
Start-up Companies
Healthcare Systems

MS in Health Technology

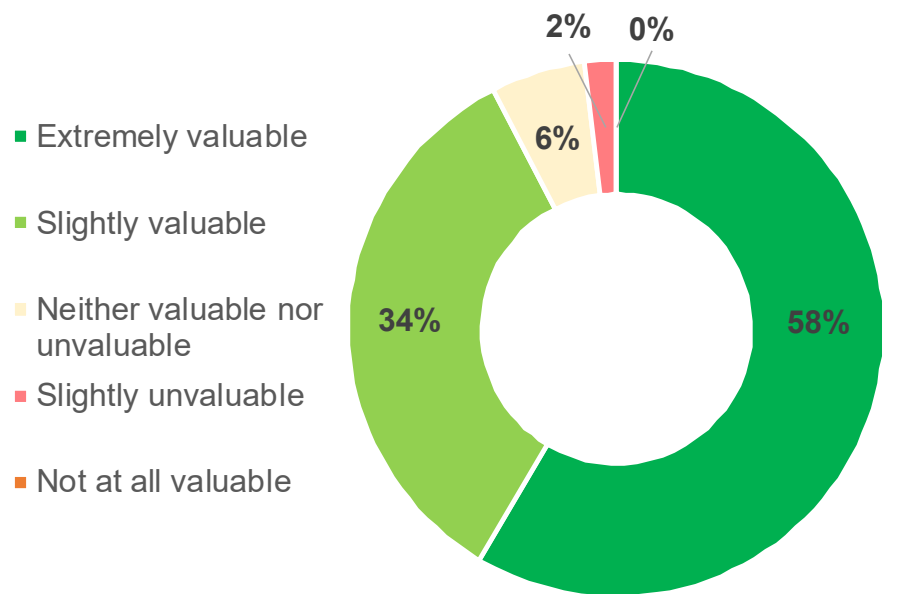
“There is a dire need for this unique program in the healthcare industry.”

How likely do you think it is that you or your organization would be interested in hiring a graduate of this type of program?



Survey of Industry Experts

How valuable to you think this new MS in Health Technology will be for educating applied health professionals?



Respondents (65) were:

- 54% female
- 74% doctorate degree holders
- 83% white
- 98% not Hispanic or Latino, and
- 80% influential in hiring

In July of 2018, the Health Technology Education Program Director Wendy A. Rogers and Assistant Director Nicole Holtzclaw-Stone launched an industry survey. The survey asked about program particulars, hireability of graduates of this type of program, and the value of this type of training. The data revealed a preference for the label of “capstone project” for the applied work experience associated with the program. **68%** of respondents stated that their company would consider becoming a capstone project site. **65%** of respondents said their company would be likely to be interested in hiring a graduate of this type of program. **92%** reported that they thought the MS in Health Technology would be valuable for educating applied health professionals.

“Overall your program seems excellent.”

Certificates, Digital Badges, and Continuing Education

Undergraduate Certificate Topics may include:

Health Technology

Health Technology Informatics

Health Technology Research Methods

Health Technology and Aging

Health Technology Robotics

Target launch date:

Spring 2019





Graduate Certificates will allow masters and PhD students who are not enrolled in the MS in Health Technology Program the opportunity to specialize in Health Technology topics.

Digital Badges provide a platform for organizations/agencies to certify students skills in a digital form. Undergraduates at Illinois will be able to certify skills in Health Technology once digital badges are developed.

Continuing Education will allow working professionals to learn more about Health Technology topics relevant to their line of work.

Future Directions for the Health Technology Education Program

Health Technology Hiring and Program Proposals

Health Technology Hiring in Kinesiology and Community Health

In Fall of 2018, Kinesiology and Community Health advertised for a Teaching Assistant Professor to teach HT 501: Understanding Users of Health Technology and HT 502: Overview of Human Factors Methods, among other courses. The new hire will start at Illinois in Fall 2019, one year before the targeted start date for the first class of the MS in Health Technology.

Health Technology Hiring in Industrial Enterprise Systems Engineering

In Spring of 2019, the Department of Industrial Enterprise Systems Engineering will advertise for a Teaching Assistant Professor to teach HT 503: Understanding Hardware Engineering for Health Technology and HT 504: Software Engineering for Health Technology, among other courses. The new hire will start at Illinois in Fall 2019, one year before the targeted start date for the first class of the MS in Health Technology.

Health Technology to send proposals to

Academic Senate and Illinois Board of Higher Education in 2019

The Health Technology Education Program plans to submit proposals to the Educational Policy Committee of the Academic Senate and the Illinois Board of Higher Education (IBHE) in 2019 for the MS in Health Technology. The proposal for the MS in Health Technology was successfully submitted to the Educational Policy Committee of the Department of Kinesiology and Community Health in Fall 2018. Additionally, the Health Technology Development Team successfully sent forward proposals for nine courses in the MS in Health Technology program to the Department of Kinesiology and Community Health in Fall 2018.

Health Technology to offer Undergrad Certificates in 2019

Undergraduate Certificate in Health Technology

The Certificate in Health Technology is aimed for undergraduate students in any major to explore the intersection of technology and human factors in health. Students will hone quantitative skills, acquire public health knowledge, and learn human factors.

Undergraduate Certificate in Health Informatics

The Certificate in Health Informatics is aimed for undergraduate students in any major to explore the ways in which data inform healthcare in society. Students will hone quantitative skills, acquire health technology knowledge, and learn data analysis.

Undergraduate Certificate in Health Technology and Aging

The Certificate in Successful Aging with Health Technology is aimed for undergraduate students in any major interested in learning more about how health technology supports aging. Students will develop skills in human factors and understand the intersection of technology, health, and aging.

Undergraduate Certificate in Health Technology Research Methods

The Certificate in Health Technology Research Methods is aimed for undergraduate students in any major to deepen their knowledge of research methods in health technology. Students will hone quantitative skills and acquire research abilities in the context of health technology.

Undergraduate Certificate in Health Technology and Robotics

The Certificate in Health Technology and Robotics is aimed for undergraduate students in any major interested in learning more about how robotics interface with health technology. Students will develop skills in human factors and understand the intersection of robotics and health.

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